

## REMARKS

The claims are 13 to 21 and 23 to 29.

In claim 13, the number averaged molecular weight (Mn) of the glycidyl group containing acrylic copolymers is specified as 10000-20000.

Moreover, the curing agent is specified.

Claim 13 as amended finds support in previous claims 13 and 22 in paragraphs 35, 46 and 47. The paragraph numbers refer to those in the published application i.e. US. 2005/0171300.

Support for the amendment to claim 21 can be found in paragraph 35.

New claim 27 finds support in paragraphs 46 and 48 and in the Examples.

New claim 28 finds support in paragraphs 55 and 56 and in the Examples.

New claim 29 finds support in paragraph 18 and in the Examples.

Claim 22 is cancelled as superfluous and the rejections thereof are moot.

Claims 13 to 21, 23 and 26 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Moens (U.S. 5,397,641) in view of Kaplan (U.S. 5,872,192) and Barkac (U.S. 6,191,225).

Claims 24 and 25 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Moens (U.S. 5,397,641), Hoebeke (U.S. 5,525,370), Kaplan (U.S. 5,872,192) and Barkac (U.S. 6,191,225) in further view of Kaplan (U.S. 6,313,234).

The above rejections are respectfully traversed.

### **The Present Invention**

The invention relates to a powder coating composition comprising a co-reactable blend of (1) a carboxyl functional polyester, (2) a glycidyl group containing acrylic copolymer and (3) a curing agent reactable with the polyester's carboxylic acid groups.

The presently claimed powders, upon application and curing produce coatings exhibiting an adjustable gloss 60° (ASTM D523) of between 10 and 70 along with excellent mechanical properties.

As will now be explained, the above rejection on Moens in view of Kaplan and Barkac raised on pages 2 and 3 of the Official Action is untenable in view of the above-amended claims.

Also the assumption of the rejection that the glycidyl group containing acrylic polymer serves both as compounds (2) and (3) is untenable in view of the above-amended claims.

By varying the stoichiometric excess of the reactive groups of the curing agent relative to the glycidyl groups for a particular acrylic copolymer, it is possible to "monitor gloss 60° values" within the matt gloss range i.e. from 10 to 70% (last sentence of [paragraph 13]).

One can e.g. compare Example 13 with Example 14, or Example 16 with Example 17 (U.S. 2005/0171300) – same polyester and GMA-acrylic copolymer yet different ratio of curing agent versus GMA-acrylic resulting in a different gloss value.

The gloss is not only adjustable but also reproducible. One of ordinary skill in the art can make and use Applicants' invention without undue experimentation.

The compositions of the present invention advantageously do not contain a carboxyl group containing semi-crystalline polyester [paragraph 18]. See also new claim 29.

#### **Matt Versus Gloss Finish**

Coatings generally are split up into glossy and reduced gloss coatings. For all values given below, reference is made to gloss value measured according to ASTM D523.

"Glossy" coatings have a 60° gloss value higher than 70%, while "high gloss" coatings exhibit a 60° gloss value of 85% and more.

High gloss coatings (like those in Moens '641) possessing a 60° gloss value of 85% and more and are thus not encompassed in the (reduced gloss) 10 to 70 range as claimed in claim 13 and claims dependent thereon.

As demonstrated below, teachings for high gloss coatings are not transferable as such to those for low gloss coatings. A person skilled in the art would thus not combine the cited references.

The combination of a carboxyl-functionalized polyester with an acrylic copolymer having a number average molecular as in Moens '641 results in glossy coatings.

Please note that only through the design of a particular polyester, Moens '641 is able to achieve improved coating flexibility (Direct and Reverse impact of 80 kg.cm and higher). If the polyester were not be tailored, mechanical properties like flexibility would not be good (see column 2, lines 9 to 57 of Moens '641; or see column 13, lines 35 to 60 therein).

The composition of the polyester has thus to be very specific in order to allow the use of glycidyl group containing acrylic copolymers. Addition of a curing agent like a  $\beta$ -hydroxyalkylamide does not further increase obtained flexibility – see the Examples presented in the attached Rule 132 Declaration of Dr. Luc Moens, the first named inventor herein.

This is not so for coating formulations according to the present invention.

- The composition of the polyester is not critical as in Moens '641, provided the three compounds as claimed are present.
- A further and important distinction: the addition of minor quantities of compound (3) such as  $\beta$ -hydroxyalkylamide has a significant impact on flexibility.

Unexpectedly, the addition of such compounds yielded a matt coating with flexibility and this without the need for a very specific polyester like in Moens '641.

The additional Examples of the Declaration show that:

- Omitting the curing agent as claimed results in a lack of flexibility for matt coatings.
- Teachings from the field of high gloss coatings (Moens, Kaplan, etc.) are not transferable as such to reduced gloss coatings (the present invention).

The assumption of the rejection on pages 5 to 6 of the Official Action issued on June 11, 2007 (and present Official Action) is untenable in view of the above. A person skilled in the art would not combine the cited references.

### **In Conclusion**

The addition of minor quantities of the curing agent as claimed, in particular  $\beta$ -hydroxyalkylamide to a binder of the invention is both novel and unobvious over the prior art.

The solution to flexibility was not found in the tailoring of the polyester (like in Moens '641) but in the formulation itself.

Apart from that, the combination of the three components of the present invention results in several unobvious advantages over the art:

- The non-critical selection of polyester compared to Moens '641.
- No need for a carboxyl group containing semi-crystalline polyester either (see new claim 29).

- The possibility to control gloss 60° values within the matt gloss range – i.e. from 10 to 70 – by changing the ratio of component (2) i.e acrylic copolymer to component (3) curing agent.

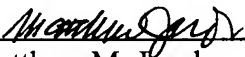
In view of the foregoing, it is apparent that claim 13 and claims dependent thereon are unobvious over the cited references, alone or in combination.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

Luc MOENS et al.

By:   
Matthew M. Jacob  
Registration No. 25,154  
Attorney for Applicants

MJ/vah/akl  
Washington, D.C. 20006-1021  
Telephone (202) 721-8200  
Facsimile (202) 721-8250  
November 17, 2008

Dr. Luc Moens declares:

That his education and professional background are as follows:

He obtained a PhD in Chemistry from the Catholic University of Leuven, Belgium, in 1985. Since 1986 he has been working in the field of Powder Coatings for UCB now Cytec Surface Specialties. Dr. Moens is first inventor of the present application and of many more inventions in the field of Powder Coatings.

That he has conducted the following tests to demonstrate that:

Comparative tests were run to show the different behavior of high gloss and low gloss coating formulations. For the setup and discussion see Annex 1A.

The results of these tests show that:

Low gloss formulations in the absence of the curing agent lack flexibility (Ex B).

Formulations of the invention can, but do not need to be based upon tailored polyesters – like e.g. the CHDA polyester of Moens (Ex C vs Ex A).

The addition of a curing agent to a high gloss formulation according to Moens makes quasi no difference (Ex D vs Ex E), whereas the impact is significant for low gloss formulations.

Results obtained with (specific) high gloss coatings are not transferable to low gloss coatings

Advantages of the claimed formulations over the art are:

No specific and tailored polyester is needed to achieve this flexibility unlike in other art cited [e.g. Moens: US 5,397,641]

One can monitor gloss 60° values within the matt gloss range - i.e. from 10 to 70% - by changing the ratio of compound (2) on compound (3)

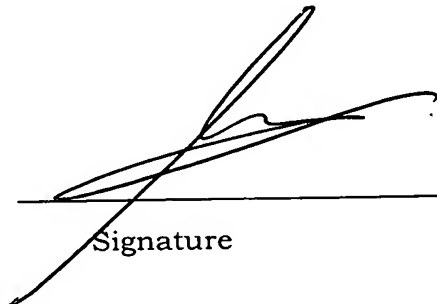
That from these tests he concludes:

A person skilled in the art would not combine the art cited. That the claims stand non-obvious over the art.

Dr. Moens further declares that all statements made herein of his own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Sections 1001 of Title 18 of the United States Code, and that willful false statements may jeopardize the validity of the application or any patent issuing thereon.

October 20, 2008

Date



Signature

## ANNEX 1

### Setup

	Polyester (1)	Acrylic copol. (2)	Curing agent (3)	Gloss 60°	DI/RI
Ex 13	Ex1	Ex 9	XL552	10	200 / 200
Ex A	Ex1	Ex 9	----	12	---- / ----
Ex B	Ex2(Moens)	Ex 9	XL552	27	120 / 140
Ex C	Ex2(Moens)	Ex 9	----	3	--- / ---
Ex D	Ex2(Moens)	Ex15(Moens)	---	88	140 / 160
Ex E	Ex2(Moens)	Ex15(Moens)	XL552	92	160 / 160

--- / ---                      no flexibility

Unless otherwise specified, the polyester and glycidyl group containing acrylic copolymer correspond to those in the Examples of US 2005/0171300. For each of the experiments the ratio of polyester over the glycidyl group containing acrylic copolymer (Acrylic copol.) was kept constant.

Polyesters used are either according to Example 1 (Ex1) of the invention or according to Example 2 (Ex2) of Moens (US 5,397,641). The glycidyl group containing acrylic copolymer is either according to Example 9 (Ex9) of the invention or according to Example 15 (Ex15) of Moens.

The acrylic copolymer of Ex9 has a number averaged molecular weight (Mn) of 15000, whereas the one according to Ex15 (Moens) has a Mn of around 5000. The first is referred to as a high Mn acrylic copolymer, whereas the second is referred to as a low Mn acrylic copolymer

The polyester according to Ex2 (Moens) is a tailored polyester comprising at least 10 mole % of 1,4-cyclohexanedicarboxylic acid (CHDA).

### Results and discussion

In Moens (US 5,397,641) high gloss coatings are obtained from a low Mn acrylic copolymer and a particular linear CHDA-terminated polyester. One notices the high gloss values for coating formulations according to Ex D and Ex E.

Ex D illustrates the effect of the particular 1,4-CHDA-terminated polyesters on flexibility of high gloss coatings. Addition of a curing agent, different from the low Mn acrylic copolymer, does not result in substantial improvements (Ex E).

The situation is completely different for low gloss coating formulations.

There, the particular CHDA-terminated polyesters do not bring flexibility to powder coating compositions comprising the particular acrylic copolymer of the invention (the high Mn acrylic copolymer) – see Ex C.

Only by adding a curing agent one obtains a low gloss and flexible coating as illustrated in Ex B.

For low gloss coating formulations, the curing agent preferably used is Primid XL552, though other curing agents can be used as illustrated in Ex 18 & 19 of the invention (US 2005/0171300).